



Technology News

December 2003

“NRCS *Technology News*,” provided by Science and Technology, delivers pertinent information to our customers about new technology, products, and services available from the Soil Survey and Resource Assessment and the Science and Technology deputy areas.

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MESSAGE FROM THE DEPUTY CHIEFS

Lawrence E. Clark and Maurice J. Mausbach



The availability of potable water is an international concern and has become a critical issue in many countries. As our numbers have increased and incomes have risen, demands on the earth's resources have multiplied over the past half century. World population grew from 2.5 billion in 1950 to 6.1 billion in 2000, exceeding all growth during the 4 million years since we have emerged as a species. Likewise, demand for water has tripled as agricultural, industrial, and residential uses climbed and

outstripped the sustainable supplies in many countries. As a result, water tables are falling and wells are going dry. Base flow and rivers are also declining to the detriment of wildlife and ecosystems. Because of these often conflicting demands for the resource, water will remain one of the most critical resources of societal concern, and thus to the Natural Resources Conservation Service (NRCS), in this century.

As water travels along its flow paths in the hydrologic cycle, it is used and reused many times before the cycle starts again. In this process, the quality of water can be impacted either positively or negatively by the use or misuse of this precious resource. Recently the Minister of Science and Technology from Iraq was addressing a group of us at the State Department. He listed three immediate concerns for the country. After security, he listed water quality as the second highest priority. Salinity from poor irrigation practices is the primary concern for water in the Tigris and Euphrates Rivers.

State and Federal governments have programs addressing water quality and quantity and are responding to the needs within the limits of budget and political support. However, these programs are often powerless to deal with the conflicts that arise in the demands for the water. The Klamath River Basin is a prime example of where needs of water for fish, agriculture, and people rise to conflicts among the various interest groups. Whatever the programs are that deal with water quality and supply; they must be coordinated with the various needs (demands) of society. As these conflicting demands for clean water increase, conflicts will also magnify. In the case of international conflicts, wars are often the result of the fight over limited resources.

In the United States the Mississippi River Basin and the Gulf of Mexico are receiving increased attention. Monitoring of the Gulf indicates a growing hypoxic zone that the U.S. Geological Survey and the Environmental Protection Agency attribute largely to the release of excessive plant nutrients from the Nation's Bread Basket.¹ As a nation, we need to make adjustments to avoid these developments. The Agricultural Drainage Management Systems and the Lower Mississippi Valley Initiatives have already begun the process in two sub-basins of the Mississippi River. The City of Des Moines has taken significant measures to remove nitrates from its surface water source, the Raccoon River.² Advances such as these are being made, but more needs to be done.

¹ See "Gulf in Peril" at <http://web.naplesnews.com/03/09/naples/e1675a.htm> for more information.

² See Des Moines Register's article, "Mid West Ag's Filthy Secret: A River Flows Beneath" at www.counterpunch.org/kauffman09092003.html for more information.

For the first 20 years after the passage of the Clean Water Act, agriculture was largely exempt from serious attention. Increasingly, environmentalists are advocating cleaning the Nation's water, particularly in the area of non-point source pollution. NRCS can help to address these issues. Without an adequate process or national political will to deal with the conflicting demands of the water resource, we will increasingly become involved in dealing with crises. As issues intensify, it is so important that we fully utilize the powerful partnership that we have to serve the agricultural sector and society. In addition, it is critical that we have the best science and technology incorporated into our standards and procedures to effectively address water concerns related to agriculture.

The Conservation Partnership can showcase these capabilities in cooperative locally led projects. These projects would provide the templates for improving outcomes, including accountability, capacity building, and training key employees and partners. If adequately supported, these projects can implement solutions on a watershed/project scale. These projects could also demonstrate implementation of innovative approaches using market-based water pollutant and carbon sequestration credit trading. Showcase watershed projects could also supplement efforts such as the Conservation Effects Evaluation Program. By successfully engaging in these projects, the Partnership would be better aligned to deal with agricultural nonpoint source pollution. With the Agricultural Drainage Management Systems gaining momentum, this will be additionally important once the states establish a nitrate standard for freshwater.

Locally led and agency assisted planning and implementation on a watershed scale are essential to provide agriculture's contribution to positive environmental, economic, and social outcomes. One key factor in successful locally led projects is the establishment of long-term local coordinators who bring together stakeholders and develop broad-based local ownership. Successful projects in the U.S. and The Land Care Program in Australia have had this common element. These showcase projects could strategically position the NRCS and its partners to take the action needed to contend with the Nation's water needs.

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CONSERVATIONIST'S CORNER

Bill Gradle

State Conservationist—Illinois



NRCS-Illinois is concerned with people and how programs influence them. As a result, we use many of the products and services offered by NRCS centers and institutes to help our staff and customers meet their needs and goals.

The laboratory at the National Soil Survey Center provided NRCS-Illinois with helpful soil analyses. Our agricultural productivity relies heavily on the practice of drainage. With naturally high water tables, many soils need drainage for economical crop production. The NRCS Water and Climate Center has provided assistance and support for NRCS-Illinois pilot drainage management demonstration projects. Widespread use of drainage management has a real potential to benefit local community, regional, and national interests. Decreased nitrate loading to streams, decreased stress or

damage to crops during dry periods, seasonal habitat for wildlife and waterfowl, and reduced nitrate loading to major river systems and to the Gulf of Mexico are some of the benefits.

While NRCS-Illinois works with other NRCS centers and institutes, we work most frequently with the Social Sciences Institute (SSI). We have achieved some notable accomplishments due to their contributions. Social Sciences Institute staff members have worked with NRCS Community Planner Jody Rendziak over the past few years. Together, they have successfully supported many NRCS ventures that support Agency goals.

NRCS in Illinois works with numerous locally led watershed groups to deliver products and services that focus on soil, water, air, plants, and animals. Because watershed ventures involve many landowners, complex issues, and the task of meeting the needs and expectations of many communities, NRCS staff members ultimately deal intensely with the “H” part of our SWAPA + H equation. That is one area where the Social Sciences Institute has come to our aid.

The Social Sciences Institute helps NRCS-Illinois use and interpret census data, identify client attitudes and trends, and implement locally-led conservation. SSI has developed many useful tools and technical guidance, including the “People, Partnership and Communities” (PPC) fact sheet series. NRCS staff members in Illinois use the PPCs and share them with stakeholders. We have even incorporated the PPCs into our own Resource Planning Guidebook, a staple for district conservationists, technical specialists, and steering committees across the state of Illinois.

SSI recently provided NRCS-Illinois with census data that helped us to quantify the number of Limited Resource Farmers and Beginning Farmers in the state. The data helped us better target our outreach and customer service efforts for programs of the 2002 Farm Bill. After our first round of EQIP funding, an SSI staff member also gave advice and a national perspective about analyzing program data. The information is helping us make better decisions about allocating funds for the program. It is saving NRCS staff time and saving our clients’ time as well.

NRCS is a technical agency; we provide technical assistance to America’s private landowners. Most of our employees have impressive educational merits in science-related fields—agronomy, soils, biology, environmental sciences. With the SSI, we have an ally to help us better serve and work with the PEOPLE who own and manage the natural resources we strive to protect.

Tap into SSI and all the centers and institutes. They have experience, data, and information that can make you and your NRCS teams more productive, more efficient, and help us all reach our goals more easily.

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NEW PRODUCTS AND SERVICES

#1 New Technical Note on Soil Compaction Available

A new soil quality-agronomy technical note summarizes the current research about detecting, preventing, and alleviating compaction. Compaction is a form of soil degradation common to all land uses. It occurs when soil particles are pressed together by repeated or heavy traffic, especially when soil is wet. As pore spaces shrink and soil strength increases, root growth and the movement of

air, water, and soil fauna can be severely restricted. The result is poor plant growth, excessive water runoff or ponding, drought susceptibility, and greater levels of anaerobic soil conditions. Even a single compaction event can cause long-term reductions in plant growth, so prevention is important. The technical note is available at <http://soils.usda.gov/sqi>.

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TECHNOLOGY TRANSFER

#2 Plant Materials and Grazing Lands Conservation Initiative Partner



*Bridger Plant
Materials Center*

The Plant Materials Program and the Grazing Lands Conservation Initiative (GLCI) have combined their efforts to promote new plants and vegetative techniques through local education and demonstration. This program allows local conservation districts to conduct range and pasture monitoring and research and demonstration projects involving a multitude of rangeland issues.

GLCI and the Bridger Plant Materials Center (PMC) have cooperated on range and pasture lands demonstration plantings in three locations across Montana near the towns of Circle, Jordan, and Judith Gap. More opportunities may be available for the two programs to partner nationwide.

The Circle planting is in cooperation with the McCone County Conservation District. It features 66 grass, forb, shrub, and tree species, plus several mixture combinations. The objective of this planting is to display commonly used and new plant materials and techniques for the successful establishment of diverse plant communities for grazing lands. The district hosts tours of the planting every year to inform and educate local landowners.

The Jordan planting is on private land and features comparisons of warm-season and cool-season grass-legume-shrub mixtures. Plant tissue is sampled at various plant maturity stages during the active growing season to determine the amount and type of nutrients available as well as the forage quality for livestock.

The demonstration planting at Judith Gap features an array of pasture species. Frequent tours are conducted, and local landowners benefit from having a planting of several species close by to observe and aid in making planting decisions.

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WEB-BASED TECHNOLOGY

#3 PLANTS Usage Increases in FY 2003



Sierra Shootingstar

PLANTS database statistics for FY 2003 reveal that the Web site has been experiencing a substantial traffic increase, with a 71 percent increase in number of hits and a 55 percent increase in number of visits. In one year, PLANTS usage nearly doubled, jumping from 7 to 12 million hits per month. In October 2002, the site had 7,018,187 hits and 281,455 visits. In September 2003, PLANTS had 11,984,342 hits and 437,268 visits. This rise also indicates that each visit is more in-depth. Visit the PLANTS Web site at <http://plants.usda.gov>.

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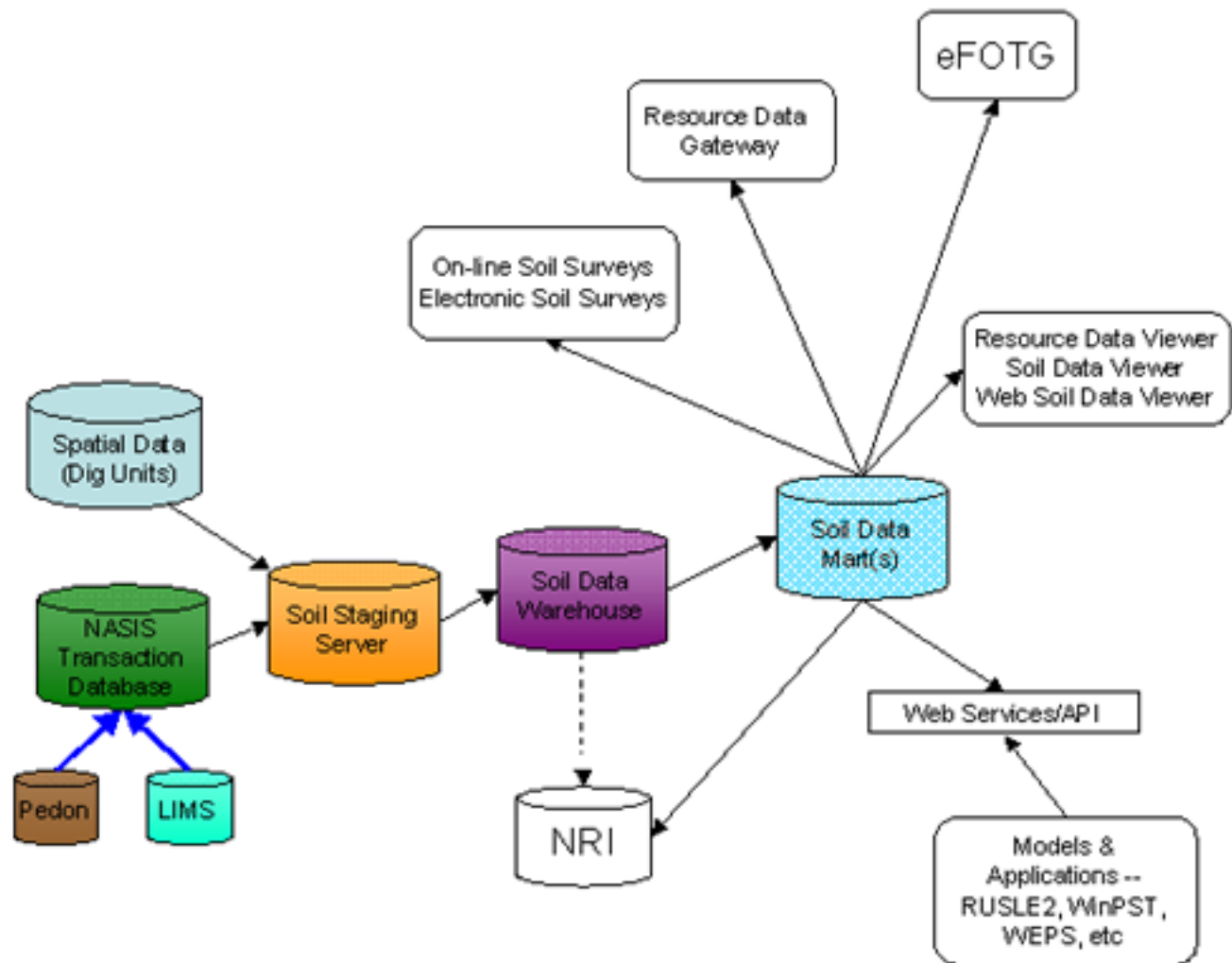
#4 Soil Data Mart Provides New Capabilities

This article was written in late October. At that time, the Soil Data Warehouse and Data Mart were in final stages of testing at ITC in Fort Collins, NCGC in Fort Worth, and NSSC in Lincoln. Developers expected that the Soil Data Mart would be available to NRCS employees and the general public by the time this article is published.

The Soil Data Warehouse and Data Mart provide a sole-source distribution point for official soil survey data used in Field Office Technical Guides, Customer Service Toolkit, and other applications. For the first time, NRCS can guarantee that field conservationists, technical service providers, and the general public have access to exactly the same soil survey data regardless of whether they use the Customer Service Toolkit, eFOTG, or SSURGO products.

The Warehouse stores current and previous versions of maps, tables, and accompanying metadata in a geodatabase. Once versioned and archived, these data do not change. The Warehouse makes the

current version of data available to NRCS employees and the public through the Soil Data Mart. The Soil Data Mart provides a Web-based interface that allows users to identify specific soil survey areas, run reports, and download SSURGO data files. Content managers can link the eFOTG directly to the Soil Data Mart in the exact context required by the eFOTG for the specific county. This eliminates redundancy and reduces the long-term workload related to managing changes in soil survey data.



The Soil Data Warehouse and Data Mart provide a framework for storing and accessing soil survey data, but the states control data stored in the Warehouse. At initial start-up, the Soil Data Mart will be empty, though some soil survey data will be available within the first few days of operation. This first phase of the Soil Data Warehouse and Data Mart includes only basic functions for accessing current data. Future Data Marts will provide capabilities to access specific historical versions of soil survey data and acquire specific data needed by programs and applications, such as RUSLE2, WinPST, and NRI.

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TRAINING

#5 *Power Tools for Women!* Seminar Reminder



Joni Daniels

Don't forget! "Power Tools for Women!" will broadcast Wednesday, December 10, 2003 from 1-2:30 p.m., e.t. Consultant Joni Daniels will teach creative strategies for building an effective network, mentoring and supporting others, enhancing your ability to influence, and discovering your strengths. Handouts are available on the SSI web site at http://www.ssi.nrcs.usda.gov/publications/4_Misc/MI005_PowerTools.pdf.

Satellite coordinates for this seminar are available on the my.NRCS Intranet site at <https://my.nrcs.usda.gov>. Click on the myNRCS tab and look under general announcements, or contact Becky Noricks at the Social Sciences Institute at (616) 942-1503 or ssinter2@po.nrcs.usda.gov.

The Leader in You training program, sponsored by the Social Sciences Institute and the National Employee Development Center, is designed to support the locally led conservation aspects of the Farm Bill and the President's Management Agenda. The National Association of Conservation Districts, the National Association of State Conservation Agencies, National Conservation District Employees Association, and the Federal Training Network are cooperating sponsors of this program. The NRCS Federal Women's Program and Earth Care Connection, USA, are new cooperating sponsors for this individual seminar.

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HONORS

#6 “Innovations in American Government” Semifinalists Announced

The National Plant Data Center (NPDC) and the National Water and Climate Center (NWCC) have been selected as semifinalists to receive the Innovations in American Government awards. This recognition is based on the NPDC’s PLANTS Web site and the NWCC’s Snow Survey and Water Supply Forecasting Program. These awards are sponsored by the Ford Foundation and administered by the John F. Kennedy School of Government. The five winners will be announced in May 2004.

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